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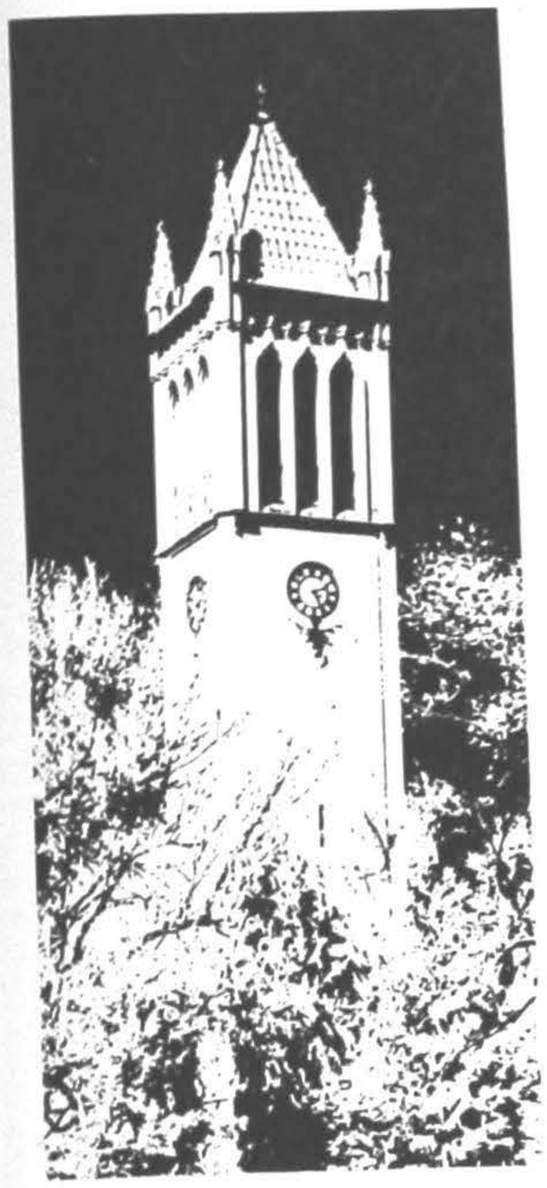

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CONTENTS

SUMMARY

This report presents historical data on trends in Grade A milk production and utilization for 1948 through 1971. Data are presented by states and regions and for the United States on proportions of milk eligible for fluid use sold to plants and dealers, quantities of fluid grade milk and manufacturing grade milk marketed, ratios of fluid grade milk used in manufactured dairy products to all milk used in manufactured dairy products, quantities of fluid grade milk used in manufactured dairy products, quantities of fluid grade milk used in fluid milk and cream products, and Class I utilization ratios.

A technical appendix describes sources and methods of derivation of the data series.

National, Regional, and State Trends in Milk Production and Utilization, 1948-71[1]

by George W. Ladd

It is widely recognized that an increasing proportion of the milk produced in this country is Grade A milk and that a substantial proportion of our manufactured dairy products is produced from Grade A milk. Comprehensive quantitative data on the sizes of, and trends in, these proportions are lacking. This report provides data on these proportions and on trends therein.

Strictly speaking, this report presents data on "milk eligible for fluid use." This is necessary because the sources of information used to construct the data differentiate between "milk eligible for fluid use" and "manufacturing grade milk," but do not differentiate between Grade A milk, milk eligible for fluid use, and manufacturing grade milk. Throughout this report the terms "milk eligible for fluid use" and "fluid grade milk" are used interchangeably. These terms can be interpreted as being synonymous with "Grade A milk" by either believing or assuming two things: (a) In most states, all milk eligible for fluid use is indeed Grade A milk. (b) In other states, milk eligible for fluid use, but not Grade A, would qualify as Grade A milk if subject to Grade A inspection.

Farm-produced milk may be sold in various forms to various outlets. a) A producer-distributor retails milk directly to consumers. b) Fluid grade whole milk is sold at wholesale to bottlers for use in fluid milk and cream products or is sold at wholesale for manufacturing into processed dairy products, such as butter, nonfat dry milk, cheese, ice cream. c) Manufacturing grade whole milk is sold at wholesale to manufacturers who produce processed dairy products. d) Farm-separated cream is sold at wholesale to manufacturers. Quantities of milk sold in the first way—directly to consumers—always have been relatively small. The main concern of this report is milk sold by farmers at wholesale to bottlers or processors.

The report is divided into three parts. The first describes and summarizes highlights of the tables included in the second part, which is a statistical appendix. Tables in this appendix present historical data on trends.

The last part of this bulletin is a technical appendix. It provides a complete listing of all sources of data used in constructing the tables in the statistical appendix and a discussion of the methods used in constructing these tables. The technical appendix will help a reader to form some idea of the reliability of the data presented in the tables and will permit him to update the tables in future years.

[1]Project 1903 of the Iowa Agriculture and Home Economics Experiment Station.

QUANTITIES OF MILK AND CREAM MARKETED

Table 1 presents data on quantities of fluid grade milk marketed at wholesale by regions for 1948 through 1971. Table 2 presents similar data by states and regions for 1961 through 1971. Tables 3 and 4 present data on quantities of manufacturing grade milk marketed at wholesale. The procedures used to estimate data in these four tables are described in the technical appendix. The information needed for estimating these quantities is not available for some states and years; these states and years are identified by dashes in tables 2 and 4. Tables 1 through 4 can easily be kept up to date in future years because the data are published regularly in U.S. Department of Agriculture publications cited in the technical appendix.

Table 5 presents data on quantities of whole milk marketed in selected states; tables 6 and 7 present data on marketings of whole milk sold directly to consumers and on marketings of farm-separated cream.

Marketings of fluid grade milk at wholesale more than doubled between 1948 and 1971, rising from 40 billion to 85 billion pounds. In 1948, the Middle Atlantic and East North Central regions marketed more than half of the 40 billion pounds marketed nationally, 23 billion pounds. In 1971, these two regions marketed somewhat less than half of the 85 billion pounds marketed nationally, 40 billion pounds. The largest absolute increase in annual fluid grade milk marketings between 1948 and 1971 occurred in the East North Central Region, from 11 to 22 billion pounds. Marketings of fluid grade milk in 1971 exceeded marketings of fluid milk in 1948 by 4 billion pounds or more in several other regions, Middle Atlantic, West North Central, South Atlantic, and Pacific. The slowest absolute growth in fluid grade marketings occurred in New England, from 3 billion pounds in 1948 to 4 billion pounds in 1971. The smallest proportional increases occurred in the New England and Middle Atlantic regions. In these two regions, 1971 marketings exceeded 1948 marketings by 38 and 51 percent. The largest proportional increases occurred in the East South Central and Mountain regions. In these regions, 1971 marketings exceeded 1948 marketings by 249 and 257 percent.

In contrast to the steady upward trends in fluid grade milk marketings shown in table 2, table 3 shows that national manufacturing grade milk marketings rose from 29 billion pounds in 1948 to 37 billion pounds in 1964, then fell to 27 billion pounds in 1971. In 1948, the East North Central and West

North Central regions marketed three-fourths of all manufacturing grade milk. By 1971 their proportion of the total had risen slightly, to five-sixths. The West North Central Region is the only one whose 1971 marketings of manufacturing grade milk exceeded its 1948 marketings. In two other regions, East South Central and Mountain, 1971 marketings were only slightly smaller than 1948 marketings of manufacturing grade milk.

Quantities of whole milk sold directly to consumers by producers have constituted only a small fraction of all milk marketed in the United States since World War II. The quantity sold directly to consumers was 2.1 billion pounds in 1961 and declined to 1.6 billion pounds in 1971 (see table 6).

Table 7 shows that the quantity of milk marketed as farm-separated cream fell by some 95 percent between 1948 and 1971, from 19.7 billion to 1.0 billion pounds. Marketings of farm-separated cream were smaller in every region in 1971 than in 1948.

Tables 1 through 7 can easily be updated in future years by using the data sources and procedures described in the technical appendix.

MARKETINGS OF FLUID GRADE MILK AS PROPORTIONS OF MILK MARKETED

Whereas tables 1 through 7 dealt with quantities of milk marketed, tables 8 through 11 present historical data on proportions of *whole* milk marketed at wholesale and eligible for fluid use. Table 8, the most comprehensive of the four, presents data by states and regions for 1948 through 1971. The procedure used to obtain the estimates in table 8 is described in the technical appendix. The data needed for computing these estimates are not available for some states and years; these states and years are identified by dashes in table 8. The U.S. Department of Agriculture annually publishes figures on the ratio of fluid grade milk to all whole milk sold at wholesale by regions for years since 1961 and, by states, for years since 1966; these figures are presented in tables 9 and 10. Tables 9 and 10 can easily be kept up to date in future years because these data are published regularly in U.S. Department of Agriculture publications cited in the technical appendix. Table 8 can be updated by using the procedure presented in the technical appendix. For years before 1961 (for regions) and before 1966 (for states), we must use the data in table 8.

The official figures in tables 9 and 10 provide a basis for judging the accuracy of the estimates in table 8. Of the percentages in table 8, 44 are directly comparable in geographic coverage with percentages in table 9. These 44 are the 11 annual proportions for each of the four regions: East North Central, West North Central, South Atlantic, United States (44 = 11 proportions x 4 regions). Of these 44 pairs, values of 19 are the same in the two tables, 21 differ by 1 percentage point, 1 differs by 2 points, and 3 differ by 3 percentage points. Likewise, the agreement between tables 8 and 10 is close. For example, the ratios for each state for 1966 are within 1 percentage point of each other, with the exception of Nebraska for which the difference is 3 percentage points. For 1970, the ratios for every state are within 1 percentage point of each other, except for North Dakota, Minnesota, Wisconsin and Missouri. Ratios for these states differ by 2, 3, 4, and 6 percentage points. These comparisons indicate that the simple method used to generate table 8 does provide estimates sufficiently accurate for studying trends and making interstate and interregional comparisons.

For the entire 48 states, the ratio of fluid grade milk to all whole milk marketed at wholesale rose from 59 percent in 1948-49 to 66 percent in 1959-60 and to 76 percent in 1971. In 1948, the ratio exceeded 90 percent in only two regions, New England and Middle Atlantic. By 1966, the ratio equaled or exceeded 90 percent in five regions, New England, Middle Atlantic, South Atlantic, West South Central, and Pacific.

Table 8 shows downward trends in the proportions of fluid grade milk for the states in the West North Central Region. For the entire West North Central Region, the proportion fell from 37 percent in 1948 to 28 percent in 1966, and then rose to 41 percent in 1971. The explanation of the downward trends in the proportion of fluid grade milk marketings seems to lie in the rapid shift from marketing of farm-separated cream to marketing of manufacturing grade milk that took place during this period. Marketings of fluid grade milk rose, but marketings of manufacturing grade milk rose even faster, and marketings of farm-separated cream fell.

All whole milk marketed in the New England states since 1948 has been eligible for fluid use.

For all regions other than the West North Central Region and New England, the ratios in table 8 show steady upward trends. For nearly all states other than those in the West North Central Region, the ratios also show steady upward trends.

In every year, the West North Central Region has the lowest ratio of any region. In most years, the East North Central Region has the next lowest ratio; in some years, the East South Central Region has the second lowest ratio of any region.

The importance of marketings of fluid grade milk relative to marketings of all whole milk varies substantially within all regions except the North Atlantic Region. Table 8 shows the following ranges in 1971. a) In the East North Central Region, the ratio varied from 57 percent for Wisconsin to 90 percent for Ohio. b) In the West North Central Region, the ratio varied from 19 percent for South Dakota to 74 percent for Kansas. c) In the South Central Region, the ratio varied from 64 percent for Arkansas to 100 percent for Louisiana and Texas. d) In the West, the ratio varied from 29 percent for Idaho to 100 percent for Colorado, New Mexico, Arizona, Nevada, and Washington.

Most states are included in both tables 8 and 10; some are included in only one; a few are included in neither. Table 11 presents rough estimates of the ratio of fluid grade milk to all whole milk

marketed at wholesale for the states and years not in either table 8 or 10.

Tables 8 through 11 have presented data on the ratio of fluid grade milk marketed at wholesale to *all whole milk* marketed at wholesale. This ratio gives a misleading picture, however, of the relative importance of the fluid grade milk industry in states where marketings of farm-separated cream are significant. Table 12 presents data on the ratio of fluid grade milk marketed at wholesale to *all milk* marketed at wholesale. All milk marketed at wholesale equals all whole milk marketed at wholesale, plus the whole-milk equivalent of farm-separated cream sold at wholesale.

The percentages in table 12 are equal to or smaller than the percentages in table 8 for each area and year. Percentages from the two tables are equal if no cream is marketed. The differences between the percentages in the two tables are small if cream marketings are small relative to whole milk marketings but are large if cream marketings are large relative to whole milk marketings.

Whereas the ratios for the West North Central Region and individual states in table 8 declined steadily until the mid-1960's, the ratios in table 12 show a steady upward trend since 1948. The difference between the two reflects mostly the rapid decline in marketings of farm-separated cream in this region.

For the entire 48 states, the ratio of fluid grade milk to all milk marketed at wholesale rose from 46 percent in 1948-49 to 61 percent in 1959 to 75 percent in 1971. In 1948, the two lowest and two highest ratios were: 15 and 27 percent in the West North Central and Mountain regions, and 94 and 99 percent in the Middle Atlantic and New England regions. In 1959, the two lowest and two highest ratios were 22 and 53 percent in the West North Central and East North Central regions, and 97 and 100 percent in the Middle Atlantic and New England regions. In 1971, the two lowest ratios were 39 and 68 percent in the West North Central and Mountain regions.

UTILIZATION OF FLUID GRADE MILK

Tables 1 through 12 have dealt primarily with farm production. The next few tables are concerned with utilization of fluid grade milk. Table 13 provides data on the proportions of fluid grade milk to all milk used in manufactured dairy products. Table 14 shows quantities of fluid grade milk used in manufactured dairy products. Table 15 shows quantities of fluid grade milk used in fluid milk and cream products, and table 16 presents class I utilization ratios.

In tables 13 through 16, the 48-state national data are most reliable, the regional figures are generally next most reliable, and the individual state data generally are least reliable. Table 14 is the basic table; the other three are derived from it. Each state entry in table 14 is intended to show the quantity of fluid grade milk produced in a state and used in manufactured milk products, either in that state or in some other state. Because of the nature of the available data and the procedure used to construct table 14, the entries in table 14 may contain errors. The entries do contain errors if the total quantity of milk (fluid grade, manufacturing grade, and farm-separated cream equivalent) produced in other states and shipped into the state for processing into manufactured dairy products differs from the total amount of milk produced in the state and shipped into other states for use in manufactured dairy products. If inshipments exceed outshipments, the figure in table 14 is too low; if outshipments exceed inshipments, the entry in table 14 is too high. The negative entries in tables 13 and 14 and the entries exceeding 100 percent in table 16 are due to excesses of inshipments over outshipments. To construct highly reliable estimates of quantities of whole milk used in manufactured dairy products by states, we need data on interstate shipments that we do not now have.

I expect the regional data to be more reliable than the state data because interregional movements of milk for manufacturing are smaller relative to regional milk production than are interstate (but intraregional) movements of milk for manufacturing. And international movements of milk for manufacturing are negligible.

National data in table 13 show that nearly one-third of the milk used in manufactured dairy products in 1961 was fluid grade milk and that about half was fluid grade milk by 1971. The regions having the lowest proportions in 1961 were West North Central, East South Central, Mountain, and East North Central with 6, 22, 30, and 31 percent. These regions still had the lowest ratios in 1971, 26, 51, 48, and 50 percent. Since 1961, all milk going into manufactured dairy products in New England has been fluid grade milk, and nearly all milk used in manufactured products in the Middle Atlantic region has been fluid grade milk.

According to the data in table 14, the quantity of fluid grade milk used in manufactured dairy products in 48 states rose from 19.7 to 33 billion pounds between 1961 and 1971. Of these quantities, 61 percent came from the Middle Atlantic and East North Central regions in 1961, and 48 percent came from these regions in 1971. According to the data in table 15, the quantity of fluid grade milk used in fluid milk and cream products was nearly the same in 1971 as in 1961. The amount of fluid grade milk used in fluid products changed little between 1961 and 1971, but the amount of fluid grade milk used in manufactured dairy products rose. Thus, the class I utilization ratio in the United States fell from 73 to 61 percent (table 16). The ratio declined in every region. In 1961, the ratio ranged from 66 to 69 percent for the Middle Atlantic, East North Central, and Mountain regions, and from 76 to 81 percent for the other regions. In 1971, the ratio ranged between 45 and 58 percent for the East North Central, West North Central, Mountain, and Pacific regions and ranged between 65 and 80 percent for the other regions.

STATISTICAL APPENDIX
Tables[1]

Table 1. Quantities of fluid grade milk marketed at wholesale, by regions, 1948-71, in millions of pounds.

Table 2. Quantities of fluid grade milk marketed at wholesale, by states and regions, 1961-71, in millions of pounds.

Table 3. Quantities of manufacturing grade milk marketed at wholesale, by regions, 1948-71, in millions of pounds.

Table 4. Quantities of manufacturing grade milk marketed at wholesale, by states and regions, 1961-71, in millions of pounds.

Table 5. Quantities of whole milk marketed at wholesale, 1961-70, states and years not included in tables 2 and 4, in millions of pounds.

Table 6. Quantities of whole milk sold directly to consumers, by states and regions, 1961-71, in millions of pounds.

Table 7. Quantities of milk marketed as farm-separated cream, by states and regions, 1948-71, in millions of pounds.

Table 8. Percentages of whole milk, sold to plants and dealers, that were eligible for fluid use, by states and regions, 1948-71.

Table 9. Percentages of whole milk, sold to plants and dealers, that were eligible for fluid use, by regions, 1961-71.

Table 10. Percentages of whole milk, sold to plants and dealers, that were eligible for fluid use, by states, 1966-71.

Table 11. Derived estimates of percentages of whole milk, sold to plants and dealers, that were eligible for fluid use, 1961-70, for states of Delaware, Maryland, West Virginia, and South Carolina; and 1968-70 for Wyoming.

Table 12. Ratios of marketings of fluid grade milk at wholesale to marketings of all milk at wholesale, by states and regions, 1948-71, in percentages.

Table 13. Percentages of all milk used in manufactured dairy products, that were fluid grade milk, by states, regions, and United States, 1961-71.

Table 14. Quantities of fluid grade milk used in manufactured dairy products by states, regions, and United States, 1961-71, in millions of pounds.

Table 15. Quantities of fluid grade milk used in fluid milk and cream products, by states, regions, and United States, 1961-71, in millions of pounds.

Table 16. Class I utilization ratios: percentages of fluid grade milk used in fluid milk and cream products, by states, regions, and United States, 1961-71.

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[1]Sources of data for all tables are given in the technical appendix.

Table 1. Quantities of fluid grade milk marketed at wholesale, by regions, 1948-71, in millions of pounds

Region	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
New England	3,057	3,313	3,375	3,365	3,438	3,728	3,821	3,937	3,990	4,041	4,155	4,111
Middle Atlantic	11,555	12,731	13,135	13,223	13,575	13,857	14,435	15,335	15,623	15,339	15,814	15,887
East North Central	11,186	11,611	12,041	12,302	13,853	14,696	15,321	15,134	16,172	16,166	17,437	17,603
West North Central	3,151	2,950	3,213	3,498	3,568	3,979	4,360	4,308	4,571	4,862	5,325	5,528
South Atlantic	2,821	3,152	3,449	3,684	3,940	4,408	4,700	4,963	5,459	5,821	5,917	6,179
East South Central	1,287	1,494	1,564	1,646	1,681	2,024	2,123	2,355	2,621	2,748	2,794	3,022
West South Central	2,179	2,416	2,679	2,765	2,986	3,276	3,423	3,573	3,897	4,064	4,132	4,266
Mountain	857	1,010	1,071	1,169	1,288	1,494	1,660	1,774	1,916	1,999	2,137	2,262
Pacific	4,381	4,356	4,566	4,837	5,028	5,456	5,874	5,984	6,464	7,014	7,269	7,721
48 States	40,440	42,948	45,117	46,476	48,854	53,024	55,712	57,953	61,133	62,410	65,056	66,534

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
New England	4,174	4,329	4,366	4,359	4,370	4,399	4,175	4,047	4,024	4,092	4,119	4,205
Middle Atlantic	16,751	17,372	17,539	18,042	18,179	18,175	17,570	17,444	16,975	17,323	17,241	17,435
East North Central	18,062	19,306	20,210	20,720	21,100	20,960	20,155	19,526	19,236	19,907	20,530	22,259
West North Central	5,762	5,955	5,763	6,366	6,192	6,354	6,047	6,058	6,489	6,739	7,457	8,647
South Atlantic	6,406	6,568	6,603	6,651	6,787	6,963	7,105	7,187	7,294	7,446	7,743	8,010
East South Central	3,139	3,329	3,352	3,326	3,438	3,712	3,889	3,946	4,017	4,126	4,314	4,496
West South Central	4,425	4,772	4,873	4,763	4,842	5,002	5,096	5,278	5,236	5,280	5,363	5,621
Mountain	2,328	2,377	2,432	2,533	2,623	2,634	2,637	2,684	2,734	2,799	2,921	3,060
Pacific	7,801	7,987	8,250	8,449	9,255	9,098	9,582	9,636	9,922	10,031	10,624	11,084
48 States	69,231	71,857	73,397	74,297	76,857	77,664	75,784	75,723	75,930	77,913	80,310	84,710

Table 2. Quantities of fluid grade milk marketed at wholesale, by states and regions, 1961-71, in millions of pounds a/

Geographic Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Maine	620	625	620	615	605	590	565	558	576	585	600
New Hampshire	365	380	375	370	365	355	348	340	340	335	343
Vermont	1,885	1,900	1,925	1,945	1,985	1,830	1,760	1,800	1,855	1,910	1,970
Massachusetts	700	710	700	705	700	670	650	620	610	595	600
Rhode Island	104	101	99	95	94	87	79	73	74	69	67
Connecticut	655	650	640	640	650	643	645	633	637	625	625
New England	4,329	4,366	4,359	4,370	4,399	4,175	4,047	4,024	4,092	4,119	4,205
New York	9,984	10,104	10,327	10,504	10,600	10,170	10,060	9,860	10,095	10,000	10,045
New Jersey	1,100	1,095	1,065	1,020	980	900	825	770	750	695	650
Pennsylvania	6,264	6,456	6,591	6,615	6,550	6,440	6,566	6,349	6,481	6,586	6,653
Middle Atlantic	17,372	17,539	18,042	18,179	18,175	17,570	17,444	16,975	17,323	17,241	17,435
Ohio	4,008	4,076	4,100	4,163	4,083	3,973	3,809	3,711	3,749	3,816	3,878
Indiana	2,062	2,076	2,181	2,309	2,205	2,114	1,965	1,877	1,903	1,905	2,029
Illinois	2,551	2,546	2,540	2,569	2,525	2,302	2,180	2,067	2,096	2,011	2,026
Michigan	3,923	4,363	4,436	4,670	4,496	4,064	3,839	3,784	3,792	3,885	4,094
Wisconsin	6,496	7,179	7,690	7,826	7,674	7,513	7,818	7,867	8,523	8,915	10,496
East North Central	19,306	20,210	20,720	21,100	20,960	20,155	19,526	19,236	19,907	20,530	22,259
Minnesota	1,610	1,412	1,606	1,617	1,614	1,765	1,828	1,972	2,085	2,400	3,025
Iowa	1,114	1,090	1,152	1,246	1,223	1,076	1,089	1,138	1,159	1,363	1,420
Missouri	1,393	1,408	1,438	1,467	1,423	1,355	1,405	1,418	1,489	1,641	1,831
North Dakota	226	217	224	245	225	224	243	210	190	214	234
South Dakota	190	168	194	210	211	206	213	219	179	205	253
Nebraska	563	527	544	565	510	496	501	524	512	598	619
Kansas	961	928	943	983	955	997	1,030	1,060	1,100	1,159	1,177
West North Central	5,955	5,763	6,366	6,192	6,354	6,047	6,058	6,489	6,739	7,457	8,647
Delaware	--	--	--	--	--	--	--	--	--	--	128
Maryland	--	--	--	--	--	--	--	--	--	--	1,525
Virginia	1,164	1,153	1,161	1,201	1,221	1,247	1,265	1,353	1,329	1,386	1,443
West Virginia	--	--	--	--	--	--	--	--	--	--	318
North Carolina	1,046	1,075	1,096	1,132	1,180	1,163	1,201	1,213	1,236	1,290	1,318
South Carolina	--	--	--	--	--	--	--	--	--	--	478
Georgia	795	801	795	804	874	897	937	990	1,060	1,135	1,150
Florida	1,235	1,243	1,265	1,295	1,335	1,420	1,445	1,415	1,420	1,525	1,680
South Atlantic	6,568	6,603	6,651	6,787	6,963	7,105	7,187	7,294	7,446	7,743	8,010
Kentucky	1,037	1,045	1,053	1,095	1,166	1,250	1,294	1,271	1,322	1,430	1,520
Tennessee	1,018	1,003	995	1,034	1,116	1,161	1,181	1,231	1,289	1,336	1,404
Alabama	596	612	603	618	645	651	669	663	671	694	719
Mississippi	742	733	716	728	790	823	842	835	854	874	875
East South Central	3,329	3,352	3,326	3,438	3,712	3,889	3,946	4,017	4,126	4,314	4,496
Arkansas	425	408	390	389	390	401	410	415	424	397	409
Louisiana	755	780	800	835	890	910	940	945	1,000	1,020	1,075
Oklahoma	978	984	953	953	999	1,029	1,068	1,054	1,029	1,030	1,030
Texas	2,604	2,690	2,621	2,668	2,717	2,750	2,850	2,815	2,835	2,920	3,105
West South Central	4,772	4,873	4,763	4,842	5,002	5,096	5,278	5,236	5,280	5,363	5,621
Montana	200	199	202	211	210	216	220	228	231	227	244
Idaho	288	289	266	284	313	346	321	332	338	378	423
Wyoming	68	73	77	83	83	81	82	--	--	--	105
Colorado	607	626	649	687	684	681	696	703	745	780	798
New Mexico	207	220	245	252	253	245	260	266	258	253	264
Arizona	440	440	470	484	489	492	496	510	523	540	575
Utah	471	489	500	497	489	469	470	472	491	521	555
Nevada	101	106	113	120	125	125	125	129	131	134	132
Mountain	2,377	2,432	2,533	2,623	2,634	2,637	2,684	2,734	2,799	2,921	3,060
Washington	1,617	1,656	1,682	1,718	1,717	1,761	1,762	1,779	1,825	1,925	2,045
Oregon	552	578	545	562	596	622	647	651	664	695	741
California	5,861	6,004	6,248	6,876	6,828	7,151	7,267	7,507	7,566	7,983	8,219
Pacific	7,987	8,250	8,449	9,255	9,098	9,582	9,636	9,922	10,031	10,624	11,084
48 States	71,857	73,397	74,297	76,857	77,664	75,784	75,723	75,930	77,913	80,310	84,710

a/ Dashes indicate that basic data needed for computations were unavailable.

Table 3. Quantities of manufacturing grade milk marketed at wholesale, by regions, 1948-71, in millions of pounds

Region	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
New England	0	0	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	544	656	448	325	362	806	570	458	516	491	356	407
East North Central	15,574	16,299	15,639	15,468	14,947	15,984	16,269	16,861	16,564	16,962	15,777	15,116
West North Central	5,436	5,990	5,590	5,357	5,822	7,136	7,425	8,362	9,986	11,078	11,472	11,912
South Atlantic	679	739	721	666	685	760	759	748	730	764	672	687
East South Central	1,625	1,769	1,881	1,834	1,974	2,236	2,227	2,244	2,458	2,546	2,351	2,216
West South Central	726	784	791	665	569	624	637	675	682	629	579	538
Mountain	1,423	1,281	1,303	1,293	1,273	1,464	1,569	1,464	1,433	1,484	1,448	1,496
Pacific	2,529	2,739	2,739	2,383	2,312	2,639	2,701	2,803	2,439	2,276	1,991	1,858
48 States	28,570	30,342	29,088	28,004	28,447	31,543	32,162	33,025	34,388	35,874	34,570	34,275

Region	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
New England	0	0	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	307	318	431	145	165	165	160	141	120	122	174	35
East North Central	14,838	14,564	14,755	14,280	14,845	13,800	12,670	12,484	12,299	11,393	11,055	10,001
West North Central	12,886	14,230	14,967	14,854	16,573	15,631	15,398	15,732	15,361	14,521	13,848	12,598
South Atlantic	641	657	629	570	511	516	429	442	425	417	323	290
East South Central	2,226	2,421	2,448	2,389	2,217	2,133	1,941	1,944	1,813	1,694	1,596	1,499
West South Central	530	548	512	442	398	388	314	307	299	325	342	359
Mountain	1,520	1,513	1,460	1,425	1,322	1,303	1,282	1,293	1,305	1,270	1,313	1,355
Pacific	1,999	1,972	1,948	1,743	1,214	1,323	1,065	1,119	1,078	1,029	1,051	1,096
48 States	34,564	36,361	37,141	36,760	37,174	34,892	33,731	33,545	32,697	30,601	29,704	27,340

Table 4. Quantities of manufacturing grade milk marketed at wholesale, by states and regions, 1961-71, in millions of pounds[a/]

Geographic Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
New England[b/]	0	0	0	0	0	0	0	0	0	0	0
New York	81	81	0	0	0	0	0	0	0	0	0
New Jersey	0	0	0	0	0	0	0	0	0	0	0
Pennsylvania	261	234	204	205	210	220	134	116	119	134	122
Middle Atlantic	318	431	145	165	165	160	141	120	122	174	35
Ohio	1,002	1,019	980	932	842	707	636	569	521	424	417
Indiana	948	894	819	721	615	486	440	418	382	390	361
Illinois	1,429	1,414	1,380	1,231	1,150	1,078	970	928	799	744	668
Michigan	897	807	764	760	744	751	641	621	628	580	501
Wisconsin	10,554	10,591	10,110	10,764	10,426	9,837	9,712	9,693	8,907	8,915	7,789
East North Central	14,564	14,755	14,280	14,845	13,800	12,670	12,484	12,299	11,393	11,055	10,001
Minnesota	7,640	7,938	7,844	8,553	8,286	7,625	7,742	7,693	7,140	6,830	6,225
Iowa	3,136	3,510	3,748	4,124	3,727	3,729	3,626	3,362	3,231	2,897	2,795
Missouri	1,817	1,722	1,582	1,503	1,487	1,535	1,485	1,418	1,386	1,189	999
North Dakota	159	248	291	315	285	276	327	400	420	436	426
South Dakota	645	717	766	890	934	994	1,062	1,161	1,166	1,160	1,092
Nebraska	287	373	446	585	650	694	759	796	758	762	736
Kansas	444	472	442	462	455	473	480	480	445	451	413
West North Central	14,230	14,967	14,854	16,573	15,631	15,398	15,732	15,361	14,521	13,848	12,598
Delaware	--	--	--	--	--	--	--	--	--	125	0
Maryland	--	--	--	--	--	--	--	--	--	1,520	0
Virginia	386	387	349	319	329	293	280	277	296	244	212
West Virginia	--	--	--	--	--	--	--	--	--	325	6
North Carolina	89	80	69	58	60	77	74	62	64	40	42
South Carolina	--	--	--	--	--	--	--	--	--	476	0
Georgia	20	19	15	16	11	8	8	0	0	0	0
Florida	0	0	0	0	0	0	0	0	0	0	0
South Atlantic	657	629	570	511	516	429	442	425	417	323	290
Kentucky	1,118	1,170	1,207	1,135	1,089	1,015	976	974	908	840	780
Tennessee	902	937	885	806	814	749	759	699	641	629	602
Alabama	39	33	32	32	35	24	21	31	29	21	21
Mississippi	298	267	224	207	190	157	148	125	106	86	75
East South Central	2,421	2,448	2,389	2,217	2,133	1,941	1,944	1,813	1,694	1,596	1,499
Arkansas	320	312	260	231	230	214	205	200	201	223	231
Louisiana	0	0	0	0	0	0	0	0	0	0	0
Oklahoma	177	176	152	132	131	106	112	106	116	114	130
Texas	61	35	29	32	33	0	0	0	0	0	0
West South Central	548	512	442	398	388	314	307	299	325	342	359
Montana	40	41	38	34	34	32	30	28	24	28	25
Idaho	1,187	1,156	1,159	1,081	1,032	989	1,024	1,028	997	1,022	1,047
Wyoming	49	48	48	46	43	38	39	--	--	117	10
Colorado	23	19	16	13	16	19	19	17	0	0	2
New Mexico	0	0	0	0	0	0	0	0	0	0	0
Arizona	0	0	0	0	0	0	0	0	0	0	0
Utah	209	186	175	153	166	186	195	203	210	234	235
Nevada	0	0	0	0	0	0	0	0	0	0	0
Mountain	1,513	1,460	1,425	1,322	1,303	1,282	1,293	1,305	1,270	1,313	1,355
Washington	83	74	48	32	33	14	23	11	0	0	0
Oregon	353	357	335	308	254	233	203	209	201	185	169
California	1,493	1,529	1,334	973	993	866	853	843	804	887	1,006
Pacific	1,972	1,948	1,743	1,214	1,323	1,065	1,119	1,078	1,029	1,051	1,096
48 States	36,361	37,141	36,760	37,174	34,892	33,731	33,545	32,697	30,601	29,704	27,340

[a/] Dashes indicate that basic data needed for computations were unavailable.

[b/] New England region contains states of New Hampshire, Vermont, Massachusetts, Rhode Island, Maine and Connecticut. No manufacturing grade milk has been marketed in these states since 1948.

Table 5. Quantities of whole milk marketed at wholesale, 1961-70, states and years not included in Tables 2 and 4, in millions of pounds

State	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Delaware	170	164	166	158	149	139	134	129	133	136
Maryland	1,455	1,470	1,485	1,505	1,500	1,480	1,465	1,480	1,520	1,540
West Virginia	430	400	380	370	370	355	350	340	340	325
South Carolina	435	440	440	440	450	455	470	460	465	473
Wyoming[a/]	--	--	--	--	--	--	--	123	121	117

[a/] 1961-67 data in Tables 2 and 4.

Table 6 . Quantities of whole milk sold directly to consumers, by states and regions, 1961-1971, in millions of pounds

Geographic Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Maine	30	26	25	24	23	19	16	17	19	14	14
New Hampshire	22	22	19	14	14	13	7	7	6	6	6
Vermont	21	22	24	25	24	27	29	29	27	25	24
Massachusetts	85	82	81	76	72	73	71	65	58	50	50
Rhode Island	9	9	8	8	7	6	6	5	4	4	2
Connecticut	45	44	44	43	41	39	30	27	25	20	20
New England	212	205	201	190	181	177	159	150	139	119	116
New York	138	135	132	130	132	128	117	105	105	100	100
New Jersey	35	32	31	30	31	26	27	24	22	22	22
Pennsylvania	160	165	170	175	180	180	182	190	195	201	200
Middle Atlantic	333	332	333	335	343	334	326	319	322	323	322
Ohio	36	36	36	38	37	36	33	30	27	24	23
Indiana	15	15	14	14	13	12	12	11	11	10	10
Illinois	30	28	25	22	18	15	14	13	12	12	11
Michigan	22	24	24	25	25	23	18	18	12	10	12
Wisconsin	30	29	29	29	29	26	26	26	25	25	20
East North Central	133	132	128	128	122	112	103	98	87	81	76
Minnesota	17	17	17	17	16	15	15	11	9	7	7
Iowa	31	30	29	28	27	25	23	21	20	18	16
Missouri	30	30	30	28	28	23	22	24	25	25	23
North Dakota	8	8	8	8	8	8	6	7	7	6	5
South Dakota	5	5	5	5	5	5	5	5	5	5	5
Nebraska	10	10	10	10	10	9	8	8	8	8	8
Kansas	34	30	27	25	23	21	21	21	21	21	20
West North Central	135	130	126	121	117	106	100	97	95	90	84
Delaware	3	3	3	2	2	2	2	2	2	2	2
Maryland	23	21	18	16	17	16	15	15	10	8	8
Virginia	29	28	27	26	25	24	23	15	14	11	12
West Virginia	28	24	21	18	16	13	10	9	8	10	9
North Carolina	32	30	28	26	24	22	20	20	19	19	19
South Carolina	13	13	13	13	13	12	11	10	9	7	8
Georgia	45	40	35	30	25	24	22	19	16	14	13
Florida	40	39	39	38	38	40	116	124	123	100	89
South Atlantic	213	198	184	169	160	153	219	214	201	171	160
Kentucky	51	45	40	35	30	27	24	21	19	18	15
Tennessee	25	24	23	22	21	16	15	14	14	13	13
Alabama	32	28	24	21	18	17	15	15	20	21	20
Mississippi	13	12	11	10	9	8	7	6	6	6	5
East South Central	121	109	98	88	78	68	61	56	59	58	53
Arkansas	15	15	15	15	15	15	14	14	14	14	15
Louisiana	13	15	16	17	17	17	17	16	16	16	16
Oklahoma	23	22	21	20	19	18	18	18	18	18	18
Texas	53	49	46	43	42	41	40	39	37	38	40
West South Central	104	101	98	95	93	91	89	87	85	86	89
Montana	6	6	6	7	7	7	7	6	6	6	6
Idaho	16	15	15	15	17	17	15	13	12	12	13
Wyoming	4	4	4	4	4	3	3	3	3	3	3
Colorado	21	24	26	28	27	30	33	41	48	45	47
New Mexico	9	10	8	13	22	34	33	36	38	39	38
Arizona	8	20	17	20	24	27	28	29	36	32	33
Utah	27	28	29	34	39	43	45	51	52	50	37
Nevada	0	0	0	2	2	2	2	1	2	2	2
Mountain	91	107	105	123	142	163	166	180	197	189	179
Washington	43	46	50	59	63	67	66	67	67	84	106
Oregon	35	37	36	35	36	34	32	41	43	34	47
California	626	562	523	512	489	431	434	462	395	472	371
Pacific	704	645	609	606	588	532	532	570	505	590	524
Alaska	2	1	1	1	1	1	1	1	1	1	1
Hawaii	6	6	6	7	6	7	8	8	8	8	7
United States (50 states)	2,054	1,966	1,889	1,863	1,831	1,744	1,764	1,780	1,699	1,716	1,611

Table 7. Quantities of milk marketed as farm-separated cream, by states and regions, 1948-71, in millions of pounds

Geographic Area	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Maine	7	5	5	5	4	4	4	4	4	4	3	1	1	0	0	0	0	0	0	0	0	0	0	0
New Hampshire	4	3	3	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	6	5	4	3	4	3	3	3	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Massachusetts	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhode Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Connecticut	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New England	20	15	13	11	10	8	7	7	7	6	5	2	2	0	0	0	0	0	0	0	0	0	0	0
New York	65	66	62	55	54	59	56	52	46	38	33	29	30	28	27	26	19	16	13	11	9	8	7	7
New Jersey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pennsylvania	122	140	157	140	130	130	140	145	125	105	90	75	60	55	50	45	40	35	30	25	22	18	18	15
Middle Atlantic	187	206	219	195	184	189	196	197	171	143	123	104	90	83	77	71	59	51	43	36	31	26	25	22
Ohio	443	442	428	380	330	310	260	215	175	140	110	80	58	46	38	34	28	23	19	15	11	9	7	5
Indiana	440	471	486	441	380	363	357	310	200	180	160	132	110	70	50	25	18	16	14	14	12	11	10	10
Illinois	833	897	790	690	540	510	480	419	360	290	260	140	115	90	70	50	36	30	20	16	13	11	12	10
Michigan	733	830	868	705	665	660	570	430	360	310	270	230	200	180	165	140	105	80	60	39	35	31	21	21
Wisconsin	350	460	472	371	305	173	156	130	100	90	50	50	40	30	20	14	10	9	5	5	5	2	1	
East North Central	2,799	3,100	3,044	2,587	2,220	2,016	1,823	1,504	1,195	1,010	850	632	523	416	343	263	197	158	118	89	76	64	51	46
Minnesota	3,375	3,525	3,615	3,453	3,110	2,810	2,624	2,444	2,007	1,525	1,300	1,200	1,035	890	710	605	580	445	340	300	220	180	100	73
Iowa	4,143	4,150	4,250	4,050	3,775	3,781	3,713	3,485	3,278	2,875	2,420	2,030	1,730	1,450	1,200	1,020	880	660	540	400	340	260	198	160
Missouri	816	806	823	698	640	570	566	549	528	441	360	275	225	195	175	160	150	90	60	50	32	24	19	18
North Dakota	1,274	1,250	1,272	1,277	1,311	1,348	1,370	1,369	1,385	1,360	1,400	1,360	1,290	1,190	1,110	1,010	940	840	725	570	495	415	347	288
South Dakota	1,007	970	1,004	1,000	930	982	961	960	950	915	813	765	660	570	490	400	350	330	305	240	202	150	100	85
Nebraska	1,370	1,388	1,401	1,325	1,295	1,435	1,504	1,480	1,450	1,374	1,229	1,159	1,080	1,000	920	760	630	510	390	330	278	250	162	136
Kansas	1,142	1,110	1,180	1,050	900	970	870	680	600	520	450	420	380	340	280	250	215	200	140	95	65	42	37	35
West North Central	13,127	13,199	13,545	12,863	11,961	11,796	11,608	10,967	10,198	9,010	7,972	7,209	6,400	5,635	4,885	4,205	3,745	3,075	2,500	1,985	1,632	1,321	963	795
Delaware	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maryland	16	15	17	15	12	10	8	5	5	5	4	4	3	2	1	1	0	0	0	0	0	0	0	0
Virginia	205	210	200	176	160	160	147	140	128	120	105	95	85	70	60	50	45	40	35	30	24	19	10	10
West Virginia	108	120	118	112	93	94	98	90	81	66	55	45	35	27	21	18	16	14	12	10	8	7	6	5
North Carolina	22	25	20	12	11	10	10	8	7	7	7	6	5	3	1	0	0	0	0	0	0	0	0	0
South Carolina	11	11	10	9	4	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Georgia	19	21	22	15	12	5	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Florida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Atlantic	381	402	387	339	292	282	267	246	224	201	174	151	129	102	83	69	61	54	47	40	32	26	16	15
Kentucky	371	411	372	350	291	303	306	233	145	125	110	95	40	30	20	16	12	9	7	6	4	3	3	
Tennessee	140	155	140	128	115	83	53	50	42	32	21	12	7	6	4	3	2	1	1	0	0	0	0	0
Alabama	17	25	23	20	18	16	10	8	7	5	4	3	3	2	1	0	0	0	0	0	0	0	0	0
Mississippi	40	38	40	35	21	15	14	5	3	3	3	3	2	0	0	0	0	0	0	0	0	0	0	0
East South Central	568	629	575	533	445	417	383	296	197	165	138	113	52	38	25	19	14	10	8	6	4	3	3	
Arkansas	230	227	230	180	160	150	140	125	86	70	55	32	20	13	8	5	3	1	0	0	0	0	0	0
Louisiana	5	3	2	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Oklahoma	671	612	620	530	450	480	500	460	415	380	340	260	185	150	105	80	65	60	56	35	30	26	24	23
Texas	259	238	253	148	107	97	88	70	60	50	43	35	30	25	18	15	13	9	7	5	4	3	3	3
West South Central	1,165	1,080	1,105	860	719	729	730	656	562	501	439	327	235	188	131	100	81	70	63	40	34	29	27	26
Montana	297	260	255	218	208	203	193	182	166	156	151	139	145	130	115	100	89	77	75	70	59	53	36	36
Idaho	139	129	129	108	90	89	87	73	60	50	46	47	45	42	38	35	29	26	24	18	15	12	8	7
Wyoming	82	72	72	65	60	55	61	54	51	50	46	43	40	34	28	24	24	23	21	18	15	12	11	10
Colorado	300	288	317	266	249	208	216	200	190	170	150	135	128	110	95	80	62	40	32	26	32	29	16	16
New Mexico	39	33	36	28	15	15	15	10	8	7	6	5	4	3	2	0	0	0	0	0	0	0	0	0
Arizona	10	8	10	7	5	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Utah	45	35	26	28	22	21	22	20	17	16	13	12	11	10	8	7	6	4	4	4	3	2	2	2
Nevada	22	21	19	16	14	14	14	12	11	10	10	9	8	5	4	3	2	2	2	2	2	1	1	2
Mountain	934	846	864	736	663	607	609	552	504	460	423	390	381	334	290	249	212	172	158	138	126	109	74	73
Washington	254	215	200	180	165	110	110	100	75	61	55	50	44	42	37	30	25	22	22	21	17	15	13	10
Oregon	206	193	186	161	143	134	130	120	95	83	80	75	68	60	53	40	33	27	25	18	15	13	8	8
California	71	64	70	65	51	46	47	43	36	29	21	20	14	20	19	14	12	11	9	8	6	7	4	2
Pacific	531	472	456	406	359	290	287	263	206	173	156	145	126	122	109	84	70	60	56	47	38	35	25	20
48 States	19,712	19,949	20,208	18,530	16,853	16,334	15,910	14,688	13,264	11,669	10,280	9,073	7,938	6,918	5,943	5,060	4,439	3,650	2,993	2,381	1,973	1,613	1,184	997

Table 8. Percentages of whole milk, sold to plants and dealers, that were eligible for fluid use, by states and regions, 1948-71[a/]

Geographic Area	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
New England[b/]	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
New York	95	96	98	98	98	97	98	99	99	99	99	99	99	99	99	100	100	100	100	100	100	100	100	100
New Jersey	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Pennsylvania	96	93	92	95	94	92	93	94	94	94	95	96	96	96	97	97	97	97	97	98	98	98	98	98
Middle Atlantic	96	95	97	98	97	95	96	97	97	97	98	98	98	98	98	99	99	99	99	99	99	99	99	100
Ohio	57	57	62	62	63	63	64	71	74	74	76	78	80	80	80	81	82	83	85	86	87	88	90	90
Indiana	63	68	63	58	57	61	58	57	67	59	61	64	66	69	70	73	76	78	81	82	82	83	83	85
Illinois	55	52	56	60	63	57	62	60	61	60	62	65	62	64	64	65	68	69	68	69	69	72	73	75
Michigan	71	66	65	69	68	67	68	68	67	67	79	78	80	81	84	85	86	86	84	86	86	86	87	89
Wisconsin	21	23	25	26	31	32	31	30	31	33	36	37	39	38	40	43	42	42	43	45	45	49	50	57
East North Central	42	42	44	44	48	48	49	47	49	49	53	54	55	57	58	59	59	60	61	61	61	64	65	69
Minnesota	24	17	23	24	21	19	19	23	18	17	19	18	18	17	15	17	16	16	19	19	20	23	26	33
Iowa	59	59	58	61	59	55	49	43	35	33	32	30	26	26	24	24	23	25	22	23	25	26	32	34
Missouri	33	32	34	36	36	35	37	33	34	36	37	42	42	43	45	48	49	49	47	49	50	52	58	65
North Dakota	--	--	--	--	--	--	--	--	--	--	--	81	77	59	47	44	44	44	45	43	35	31	33	36
South Dakota	79	79	77	76	73	75	75	68	60	44	36	33	29	23	19	20	19	18	17	17	16	13	15	19
Nebraska	--	--	--	--	--	--	--	--	--	--	--	85	81	66	59	55	49	44	42	40	40	40	44	46
Kansas	42	44	47	52	53	54	58	58	59	60	62	65	69	68	66	68	68	68	68	68	69	71	72	74
West North Central	37	33	37	40	38	36	37	34	31	31	32	32	31	30	28	30	27	29	28	28	30	32	35	41
Delaware	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100
Maryland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100
Virginia	61	64	66	70	70	71	72	72	74	74	75	75	76	75	75	77	79	79	81	82	83	82	85	87
West Virginia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	98
North Carolina	57	66	74	78	75	78	82	83	85	86	88	90	91	92	93	94	95	95	94	94	95	95	97	97
South Carolina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100
Georgia	96	95	92	91	93	93	94	96	96	97	97	97	97	98	98	98	98	99	99	99	100	100	100	100
Florida	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
South Atlantic	81	81	83	85	85	85	86	87	88	88	90	90	91	91	91	92	93	93	94	94	95	95	96	96
Kentucky	45	47	43	42	43	46	47	45	47	44	46	49	49	48	47	47	49	52	55	57	57	59	63	66
Tennessee	35	37	35	37	34	35	36	43	42	44	46	49	50	53	52	53	56	58	61	61	64	67	68	70
Alabama	76	75	75	76	76	80	79	84	86	87	91	92	93	94	95	95	95	95	96	97	96	96	97	97
Mississippi	44	47	53	56	58	54	58	60	61	62	67	71	73	71	73	76	78	81	84	85	87	89	91	92
East South Central	44	46	45	47	46	48	49	51	52	52	54	58	59	58	58	58	61	64	67	67	69	71	73	75
Arkansas	41	38	39	44	42	49	43	48	48	49	52	55	57	57	57	60	63	63	65	67	67	68	64	64
Louisiana	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Oklahoma	64	59	64	67	72	75	77	77	79	83	84	85	86	85	85	86	88	88	91	91	91	90	90	89
Texas	83	86	87	90	95	95	95	95	96	95	96	97	97	98	99	99	99	99	100	100	100	100	100	100
West South Central	75	76	77	81	84	84	84	84	85	87	88	89	89	90	91	92	92	93	94	95	95	94	94	94
Montana	49	54	56	65	70	70	73	80	80	80	82	83	82	83	83	84	86	86	87	88	89	90	89	91
Idaho	--	10	13	15	18	16	14	14	18	16	20	19	19	20	20	19	21	23	26	24	24	25	27	29
Wyoming	61	59	54	49	50	54	51	52	57	58	57	57	56	58	61	62	64	66	68	68	--	--	--	91
Colorado	77	80	77	77	80	84	87	88	91	91	94	96	96	96	97	98	98	98	97	97	98	100	100	100
New Mexico	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Arizona	--	--	--	--	--	--	--	--	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Utah	36	40	44	47	49	51	54	58	61	62	63	65	66	69	72	74	76	75	72	71	70	70	69	70
Nevada	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Mountain	38	44	45	48	50	51	51	55	57	57	60	60	61	61	63	64	67	67	67	68	68	69	69	69
Washington	61	61	63	73	71	70	79	82	88	88	91	92	94	95	96	97	98	98	99	99	99	100	100	100
Oregon	42	49	54	58	60	60	62	54	54	56	57	55	61	61	62	62	65	70	73	76	76	77	79	81
California	67	64	64	67	70	68	67	67	72	75	78	80	78	80	80	82	88	87	89	90	90	90	90	89
Pacific	63	61	63	67	69	67	69	68	73	76	79	81	80	80	81	83	88	87	90	90	90	91	91	91
48 States	59	59	61	62	63	63	63	64	64	64	65	66	67	66	66	67	67	69	69	69	70	72	73	76

[a/] Basic data needed for this table are not available for some states and years. These states and years are indicated by dashes.

[b/] The states in the New England region are: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. The percentage is 100 for every one of these states for each year.

Table 9. Percentages of whole milk, sold to plants and dealers, that were eligible for fluid use, by regions, 1961-71 a/

Region	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
North Atlantic	99	99	99	99	99	99	99	99	99	99	99
East North Central	57	58	60	59	60	61	60	62	66	68	70
West North Central	30	29	29	28	28	28	29	31	35	38	40
South Atlantic	90	91	92	92	93	94	94	95	95	96	97
South Central	73	74	75	76	78	80	80	81	83	84	85
Western	75	76	78	82	82	84	84	84	85	85	85
United States b/	67	67	68	68	69	69	70	70	73	74	76

a/ The North Atlantic Region of table 9 includes the New England and Middle Atlantic regions of table 8. The South Central Region of table 9 includes the East South Central and West South Central regions of table 8. The Western Region of table 9 includes the Mountain and Pacific regions of table 8.

b/ Includes Alaska and Hawaii

Source: Statistical Reporting Service, Crop Reporting Board. Milk Production; Disposition and Income 1969-70. U.S. Department of Agriculture Da 1-2(71). 1971.

Table 10. Percentages of whole milk, sold to plants and dealers, that were eligible for fluid use, by states, 1966-71 a/

State	1966	1967	1968	1969	1970	1971
Maine	100	100	100	100	100	100
New Hampshire	100	100	100	100	100	100
Vermont	100	100	100	100	100	100
Massachusetts	100	100	100	100	100	100
Rhode Island	100	100	100	100	100	100
Connecticut	100	100	100	100	100	100
New York	100	100	100	100	100	100
New Jersey	100	100	100	100	100	100
Pennsylvania	98	98	98	98	98	98
Ohio	85	86	87	88	89	90
Indiana	81	81	83	83	84	85
Illinois	68	68	71	73	74	75
Michigan	85	86	86	87	88	89
Wisconsin	43	43	46	51	54	57
Minnesota	18	19	21	25	29	33
Iowa	23	24	26	32	33	34
Missouri	48	49	52	58	64	65
North Dakota	44	39	35	33	35	36
South Dakota	17	16	15	15	16	17
Nebraska	39	40	39	40	43	46
Kansas	68	69	70	72	72	74
Delaware	--	--	--	--	100	100
Maryland	--	--	--	--	100	100
Virginia	81	82	83	82	85	87
West Virginia	--	--	--	--	--	--
North Carolina	94	94	95	95	97	97
South Carolina	--	--	--	--	--	100
Georgia	99	100	100	100	100	100
Florida	100	100	100	100	100	100
Kentucky	55	56	58	63	64	66
Tennessee	61	62	64	67	68	70
Alabama	96	95	96	97	98	97
Mississippi	84	85	87	89	91	92
Arkansas	65	66	66	64	64	64
Louisiana	100	100	100	100	100	100
Oklahoma	90	91	91	90	90	89
Texas	100	100	100	100	100	100
Montana	87	88	88	89	90	91
Idaho	26	24	24	25	27	28
Wyoming	--	--	--	--	--	--
Colorado	97	--	--	--	--	--
New Mexico	100	100	100	100	100	100
Arizona	100	100	100	100	100	100
Utah	72	71	70	70	69	70
Nevada	100	100	100	100	100	100
Washington	99	99	99	100	100	100
Oregon	73	76	76	77	79	81
California	89	89	90	91	90	89
Alaska	100	100	100	100	100	100
Hawaii	100	100	100	100	100	100
United States b/	69	70	70	73	74	76

a/ Dash indicates ratio is not published to avoid disclosing individual operations for manufacturing grade milk.

b/ Includes Alaska and Hawaii.

Source: Statistical Reporting Service Crop Reporting Board. Milk production; disposition and income 1966-67; 1967-68; 1968-69; 1969-70. U.S. Department of Agriculture Da 1-2(68), 1968; Da 1-2(69), 1969; Da 1-2(70), 1970; Da 1-2(71), 1971; Da 1-2(72), 1972

Table 11. Derived estimates of percentages of whole milk, sold to plants and dealers, that were eligible for fluid use, 1961-70, for states of Delaware, Maryland, West Virginia and South Carolina; and 1968-70 for Wyoming.

Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Del., Md., W. Va. and S.C.	93	94	94	95	95	98	97	96	98	99
Wyoming a/	--	--	--	--	--	--	--	76	68	70

a/ 1961-67 data in Table 8.

Table 12. Ratios of marketings of fluid grade milk at wholesale to marketings of all milk at wholesale, by states and regions, 1948-71, in percentages[a/]

Geographic Area	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Maine	98	99	99	99	99	99	99	99	99	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100
New Hampshire	98	99	99	99	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Vermont	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Massachusetts	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Rhode Island	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Connecticut	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
New England	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
New York	94	96	97	97	97	97	98	99	99	99	99	99	99	99	99	100	100	100	100	100	100	100	100	100
New Jersey	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Pennsylvania	93	91	89	92	91	90	91	91	92	92	94	95	95	95	96	96	96	96	96	98	98	98	98	98
Middle Atlantic	94	94	95	96	96	93	95	96	96	96	97	97	98	98	97	99	99	99	99	99	99	99	99	100
Ohio	51	52	56	56	58	59	61	68	71	72	75	77	79	79	79	80	81	83	85	85	87	88	90	90
Indiana	54	58	54	50	50	54	53	52	63	56	57	61	64	67	69	72	76	78	81	81	81	83	83	84
Illinois	44	42	46	50	55	50	55	55	56	56	59	62	60	63	63	64	67	68	68	69	69	72	73	75
Michigan	59	54	53	58	59	58	60	62	62	63	75	74	77	79	82	83	84	85	83	85	85	85	87	89
Wisconsin	20	22	24	25	30	31	31	30	31	32	36	37	39	38	40	43	42	42	43	45	45	49	50	57
East North Central	38	37	39	41	45	45	46	45	48	47	51	53	54	56	57	59	58	60	61	61	61	64	65	69
Minnesota	13	9	12	13	12	12	13	16	14	14	16	15	16	16	14	16	15	16	18	19	20	22	26	32
Iowa	12	12	12	13	14	16	15	15	15	17	19	19	18	20	19	20	20	22	20	21	24	25	31	32
Missouri	25	24	26	28	29	29	31	28	29	32	33	38	39	41	43	45	47	47	46	48	49	51	58	64
North Dakota	--	--	--	--	--	--	--	--	--	--	--	12	14	14	14	15	16	17	18	21	19	19	22	25
South Dakota	7	8	8	8	8	10	11	12	13	12	13	14	15	14	12	14	15	14	14	14	14	12	14	18
Nebraska	--	--	--	--	--	--	--	--	--	--	--	30	32	30	29	31	32	31	31	32	33	34	39	42
Kansas	18	18	19	24	27	30	33	38	41	43	46	49	54	55	55	58	59	59	62	64	66	69	70	72
West North Central	15	13	14	16	17	17	19	18	19	20	22	22	23	23	23	25	23	25	25	26	28	30	34	39
Delaware	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100
Maryland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100
Virginia	50	53	55	60	61	62	64	65	68	69	70	71	72	72	72	74	77	77	79	80	82	81	84	87
West Virginia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	97
North Carolina	54	63	71	76	74	77	81	82	85	86	88	89	90	92	93	94	95	95	94	94	95	95	97	97
South Carolina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100
Georgia	91	90	88	88	91	92	94	95	95	97	97	97	97	98	98	98	98	99	99	99	100	100	100	100
Florida	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
South Atlantic	73	73	76	79	80	81	82	83	85	86	88	88	89	90	90	91	92	92	94	94	94	94	96	96
Kentucky	33	34	32	33	34	38	39	39	44	42	43	46	48	47	47	46	49	52	55	57	57	59	63	66
Tennessee	31	33	32	34	32	33	35	42	41	43	46	49	50	53	52	53	56	58	61	61	64	67	68	70
Alabama	72	69	71	72	73	77	77	83	85	86	90	92	93	94	95	95	95	95	96	97	96	96	97	97
Mississippi	41	45	50	53	56	53	57	60	61	62	66	71	73	71	73	76	78	81	84	85	87	89	91	92
East South Central	37	38	39	41	41	43	45	48	50	50	53	57	58	58	58	58	61	63	67	67	69	71	73	75
Arkansas	25	25	26	32	32	39	35	41	43	45	49	53	56	56	56	60	63	63	65	67	67	68	64	64
Louisiana	99	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Oklahoma	32	32	35	38	44	47	48	50	54	58	61	67	73	75	78	80	83	84	86	88	89	88	88	87
Texas	71	76	77	84	90	91	92	92	93	93	94	96	96	97	98	98	98	99	100	100	100	100	100	100
West South Central	54	56	59	64	70	71	72	73	76	78	80	83	85	87	88	90	91	92	93	94	94	94	94	94
Montana	15	20	22	29	31	35	39	43	46	48	50	52	50	54	56	59	63	65	67	69	72	75	78	80
Idaho	0	9	11	13	16	15	13	14	17	16	19	19	19	19	20	18	20	23	25	24	24	25	27	29
Wyoming	33	34	30	29	31	35	33	34	38	39	40	41	41	45	49	52	54	56	58	59	--	--	--	84
Colorado	43	47	43	47	50	59	62	65	68	70	74	78	79	82	85	87	90	92	93	94	93	96	98	98
New Mexico	67	72	69	75	87	89	90	93	95	96	97	98	98	99	99	100	100	100	100	100	100	100	100	100
Arizona	--	--	--	--	--	--	--	--	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Utah	33	37	42	45	47	50	52	56	60	60	62	64	65	68	72	73	76	74	71	70	70	70	69	70
Nevada	67	67	72	75	77	80	81	84	86	88	89	91	93	95	96	97	98	98	98	98	99	99	99	98
Mountain	27	32	33	37	40	42	43	47	50	51	53	55	55	56	58	60	63	64	65	65	66	67	68	68
Washington	50	52	55	63	62	65	73	76	84	85	88	89	91	93	94	96	97	97	98	98	99	99	99	100
Oregon	33	40	44	48	51	52	55	47	49	51	52	51	57	57	59	59	62	68	71	75	74	76	78	81
California	66	63	63	66	69	68	66	67	71	75	78	80	78	80	80	82	88	87	89	89	90	90	90	89
Pacific	59	58	59	63	65	65	66	66	71	74	77	79	79	79	80	82	88	87	90	89	90	90	91	91
48 States	46	46	48	50	52	53	54	55	56	57	59	61	62	62	63	64	65	67	67	68	69	71	72	75

[a/] Marketings of all milk equals marketings of whole milk plus whole milk equivalent of farm separated cream marketed. Basic data needed for this table are not available for some states and years. These states and years are indicated by dashes.

Table 13. Percentages of all milk used in manufactured dairy products, that were fluid grade milk, by states, regions, and United States 1961-71[a/]

Geographic Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Maine	100	100	100	100	100	100	100	100	100	100	100
New Hampshire	100	100	100	100	100	100	100	100	100	100	100
Vermont	100	100	100	100	100	100	100	100	100	100	100
Massachusetts	100	100	100	100	100	100	100	100	100	100	100
Rhode Island	100	100	100	100	100	100	100	100	100	100	100
Connecticut	100	100	100	100	100	100	100	100	100	100	100
New England	100	100	100	100	100	100	100	100	100	100	100
New York	97	97	99	100	100	100	100	100	100	100	99
New Jersey	100	100	100	100	100	100	100	100	100	100	100
Pennsylvania	85	86	89	89	88	87	92	93	94	93	94
Middle Atlantic	93	92	97	96	96	96	97	97	98	96	99
Ohio	58	59	58	58	59	64	67	69	73	78	79
Indiana	22	31	39	47	48	53	60	60	63	64	67
Illinois	38	38	37	44	44	47	53	55	59	58	63
Michigan	51	59	60	63	59	53	57	57	57	69	69
Wisconsin	20	24	28	26	25	23	28	26	29	31	42
East North Central	31	33	35	34	35	35	38	37	40	44	50
Minnesota	7	7	8	8	9	9	9	15	19	23	30
Iowa	-1	-4	-7	-3	-3	-7	-2	-2	-9	2	7
Missouri	15	20	19	23	26	20	31	32	28	40	54
North Dakota	3	-1	-1	8	2	3	11	14	12	13	20
South Dakota	-11	-12	-15	-13	-15	-17	-10	-9	-24	-12	-27
Nebraska	14	8	12	16	15	16	16	15	10	22	28
Kansas	33	26	21	22	10	17	30	33	34	34	40
West North Central	6	5	6	7	8	6	8	12	12	18	26
Delaware	--	--	--	--	--	--	--	--	--	--	100
Maryland	--	--	--	--	--	--	--	--	--	--	100
Virginia	4	4	9	9	5	6	20	13	8	20	21
West Virginia	--	--	--	--	--	--	--	--	--	--	89
North Carolina	67	72	76	80	79	73	75	79	78	87	86
South Carolina	--	--	--	--	--	--	--	--	--	--	100
Georgia	88	88	90	90	94	95	95	100	100	100	100
Florida	100	100	100	100	100	100	100	100	100	100	100
South Atlantic	63	64	66	69	69	72	75	76	79	83	84
Kentucky	12	12	14	20	20	26	30	24	28	38	41
Tennessee	26	24	22	27	28	33	36	37	43	47	52
Alabama	72	78	80	81	79	85	88	83	85	89	89
Mississippi	38	37	37	39	43	52	60	62	66	70	76
East South Central	22	22	22	27	29	35	38	38	41	47	51
Arkansas	22	15	19	22	30	39	48	41	40	36	36
Louisiana	100	100	100	100	100	100	100	100	100	100	100
Oklahoma	41	42	46	55	62	70	76	78	76	81	80
Texas	83	90	91	92	93	99	99	99	100	100	100
West South Central	56	59	62	67	72	78	82	82	81	82	82
Montana	1	-1	9	17	22	27	28	36	37	51	56
Idaho	8	10	8	8	8	12	9	13	14	16	17
Wyoming	3	14	16	21	19	26	22	--	--	--	68
Colorado	69	72	75	81	85	86	87	86	92	95	95
New Mexico	92	94	100	100	100	100	100	100	100	100	100
Arizona	100	100	100	100	100	100	100	100	100	100	100
Utah	52	56	58	63	62	58	57	55	56	58	63
Nevada	80	88	87	91	91	91	90	92	96	96	92
Mountain	30	32	33	36	37	38	38	41	43	46	48
Washington	85	88	92	94	94	96	95	97	98	99	99
Oregon	19	17	17	23	35	41	54	56	57	66	71
California	44	42	48	63	63	66	69	74	75	77	76
Pacific	48	50	54	68	66	71	71	75	77	80	81
48 States	31	33	33	35	38	36	40	42	45	48	54

[a/] Dashes indicate that basic data needed for computations were unavailable.

Table 14. Quantities of fluid grade milk used in manufactured dairy products by states, regions, and U.S., 1961-71, in millions of pounds[a/]

Geographic Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Maine	103.1	99.6	87.8	90.2	65.3	56.8	57.5	62.1	68.4	66.4	72.1
New Hampshire	13.5	13.8	13.1	15.2	17.5	18.2	19.1	18.6	18.3	16.3	17.6
Vermont	254.2	287.4	346.5	326.3	366.5	341.8	372.3	360.2	490.0	503.3	597.2
Massachusetts	313.7	310.1	319.3	322.2	351.9	385.8	365.3	402.2	400.4	479.6	463.5
Rhode Island	35.3	32.0	31.3	36.6	32.0	21.9	20.3	25.2	24.0	18.9	20.3
Connecticut	135.1	152.2	144.3	131.5	192.2	183.0	193.7	201.5	241.8	216.5	242.8
New England	854.8	895.1	942.4	922.0	1025.3	1007.5	1028.3	1069.7	1242.9	1301.0	1413.4
New York	3389.5	3513.0	3648.2	3496.3	3569.9	3198.7	3422.4	3127.3	3419.1	2456.5	3481.0
New Jersey	329.9	293.5	325.8	355.5	357.6	347.0	361.4	363.5	312.1	335.2	355.6
Pennsylvania	1735.6	1772.3	1921.1	1948.2	1794.6	1702.4	1742.1	1872.6	2035.6	2040.0	2162.8
Middle Atlantic	5479.0	5462.8	5954.1	5840.1	5767.1	5308.2	5518.9	5359.3	5763.8	4791.6	6086.4
Ohio	1426.4	1507.7	1386.3	1349.6	1259.3	1281.7	1332.1	1304.2	1424.5	1534.4	1579.7
Indiana	288.2	431.8	529.1	649.2	577.6	568.7	677.1	645.0	657.8	717.1	748.2
Illinois	940.1	913.8	846.6	1000.3	932.4	975.2	1097.5	1165.5	1143.0	1051.0	1142.1
Michigan	1104.2	1399.7	1355.9	1491.3	1165.0	896.3	906.9	867.7	888.6	1321.4	1186.2
Wisconsin	2576.2	3354.2	3867.2	3839.6	3505.1	2972.7	3716.5	3450.0	3683.3	4003.2	5606.2
East North Central	6601.1	7577.2	7758.2	7893.0	7416.4	6883.7	7645.1	7362.4	7641.2	8625.1	9997.3
Minnesota	644.7	611.5	745.3	823.3	819.4	795.4	773.6	1358.8	1718.0	2038.5	2674.4
Iowa	-34.4	-194.2	-330.2	-166.5	-12.6	-267.9	-86.7	-63.6	-291.7	63.0	227.5
Missouri	341.8	479.7	409.1	500.5	543.6	407.7	685.8	678.5	551.4	800.1	1216.7
North Dakota	41.9	-16.1	-9.1	104.9	20.8	34.6	114.3	145.2	116.0	113.6	173.7
South Dakota	-121.0	-125.5	-149.1	-142.9	-163.4	-185.4	-122.5	-114.6	-252.5	-139.1	-253.4
Nebraska	211.0	112.4	158.7	230.5	201.0	206.2	212.5	192.5	111.2	254.4	339.8
Kansas	379.2	258.2	183.2	195.7	72.5	121.2	240.5	265.3	247.1	248.2	301.6
West North Central	1361.1	1139.0	1273.0	1404.5	1674.3	1039.8	1566.5	2411.1	2224.5	3255.7	4768.3
Delaware	--	--	--	--	--	--	--	--	--	--	2.0
Maryland	--	--	--	--	--	--	--	--	--	--	652.5
Virginia	17.1	18.9	38.5	35.7	17.7	20.2	76.1	44.1	26.3	65.9	58.5
West Virginia	--	--	--	--	--	--	--	--	--	--	86.5
North Carolina	190.0	207.1	212.7	224.3	231.7	205.5	221.3	227.2	224.8	259.7	255.4
South Carolina	--	--	--	--	--	--	--	--	--	--	105.8
Georgia	149.9	143.5	140.6	149.4	170.2	164.3	161.0	169.3	175.7	159.2	142.6
Florida	203.2	210.2	218.6	226.1	232.7	225.1	242.0	275.0	306.6	316.4	330.1
South Atlantic	1273.3	1241.5	1226.7	1270.6	1269.2	1240.1	1424.3	1451.0	1648.9	1640.2	1603.6
Kentucky	153.3	156.7	202.8	285.7	278.7	352.8	424.1	306.7	361.1	521.3	537.1
Tennessee	320.2	292.0	250.7	298.9	313.4	376.5	433.1	410.5	480.0	557.6	657.6
Alabama	104.5	121.4	128.3	132.1	129.1	131.7	150.7	154.3	163.2	177.4	174.1
Mississippi	185.1	158.2	132.6	132.0	144.9	172.0	217.1	205.2	201.5	202.6	231.3
East South Central	699.0	687.2	673.4	810.7	861.0	1036.9	1184.8	1092.8	1195.8	1438.9	1579.1
Arkansas	92.2	55.2	60.9	66.4	98.8	139.3	189.3	141.5	131.8	124.6	131.3
Louisiana	162.4	179.2	167.5	159.2	181.6	190.7	205.9	206.2	229.6	240.7	235.6
Oklahoma	228.1	201.1	200.0	241.4	315.9	373.7	476.6	467.6	452.4	585.4	600.5
Texas	429.6	470.0	451.5	517.9	544.6	619.2	683.8	692.4	719.0	717.2	786.8
West South Central	922.2	916.5	878.9	981.9	1146.8	1328.9	1565.6	1514.8	1524.7	1663.0	1956.2
Montana	1.8	-673.0	13.1	25.8	31.3	38.8	38.2	49.5	45.7	65.7	77.0
Idaho	102.3	136.2	109.9	92.1	93.6	135.5	107.6	157.9	170.4	194.4	213.9
Wyoming	2.2	12.4	13.5	18.7	15.9	20.3	15.7	--	--	--	43.5
Colorado	297.1	298.6	293.4	316.2	322.6	307.3	300.6	293.0	327.5	329.7	344.1
New Mexico	32.8	33.1	36.1	31.8	32.3	34.3	28.6	30.6	33.3	34.3	36.4
Arizona	88.8	85.2	80.6	95.2	103.3	99.2	99.2	142.8	162.1	176.6	201.1
Utah	236.9	241.9	254.5	270.9	273.5	261.8	266.5	254.4	272.4	331.1	406.9
Nevada	20.5	28.1	20.6	19.4	20.0	19.4	18.0	21.5	21.7	23.6	22.1
Mountain	777.5	824.8	832.7	875.2	880.7	898.7	888.3	972.6	1049.6	1188.5	1308.9
Washington	709.9	819.1	842.6	870.6	859.6	852.5	790.3	770.7	802.9	967.9	1045.3
Oregon	94.4	81.6	78.5	104.0	149.8	181.7	259.5	283.7	279.9	368.0	435.6
California	1192.5	1124.6	1228.1	1704.7	1704.3	1694.7	1900.7	2368.6	2476.0	2910.0	3116.2
Pacific	1953.8	2073.4	2123.2	2778.3	2670.7	2776.9	2910.5	3408.0	3534.8	4266.9	4676.2
48 States	19704.2	20790.5	20750.7	22848.2	23078.5	21048.5	23649.3	24644.8	25996.2	28169.0	33082.4

[a/] Dashes indicate that basic data needed for computations were unavailable.

Table 15. Quantities of fluid grade milk used in fluid milk and cream products, by states, regions, and U.S., 1961-71, in millions of pounds[a/]

Geographic Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Maine	516.9	525.4	532.2	524.8	539.7	533.2	507.5	495.9	507.6	518.6	527.9
New Hampshire	351.5	366.2	361.9	354.8	347.5	336.8	328.9	321.4	321.7	318.7	325.4
Vermont	1630.8	1612.6	1578.5	1618.7	1618.5	1488.2	1387.7	1439.8	1365.0	1406.7	1372.8
Massachusetts	386.3	399.9	380.7	382.8	348.1	284.2	284.7	217.8	209.6	115.4	136.5
Rhode Island	68.7	69.0	67.7	58.4	62.0	65.1	58.7	47.8	50.0	50.1	46.7
Connecticut	519.9	497.8	495.7	508.5	457.8	460.0	451.3	431.5	395.2	408.5	382.2
New England	3474.2	3470.9	3416.6	3448.0	3373.7	3167.5	3081.7	2954.3	2849.1	2818.0	2791.6
New York	6594.5	6591.0	6678.8	7007.7	7030.1	6971.3	6637.6	6732.7	6675.9	7543.5	6564.0
New Jersey	770.1	801.5	739.2	664.5	622.4	553.0	463.6	406.5	437.9	359.8	294.4
Pennsylvania	4528.4	4683.7	4669.9	4666.8	4755.4	4737.6	4823.9	4476.4	4445.4	4546.0	4490.2
Middle Atlantic	11893.0	12076.2	12087.9	12338.9	12407.9	12261.8	11925.1	11615.7	11559.2	12449.4	11348.6
Ohio	2581.6	2568.3	2713.7	2813.4	2823.7	2691.3	2476.9	2406.8	2324.5	2281.6	2298.3
Indiana	1773.8	1644.2	1651.9	1659.8	1627.4	1545.3	1287.9	1232.0	1245.2	1187.9	1280.8
Illinois	1610.9	1632.2	1693.4	1568.7	1592.6	1326.8	1082.5	901.5	953.0	960.0	883.9
Michigan	2818.8	2963.3	3080.1	3178.7	3331.0	3167.7	2932.1	2916.3	2903.4	2563.6	2907.8
Wisconsin	3919.8	3824.8	3822.8	3986.4	4168.9	4540.3	4101.5	4417.0	4839.7	4911.8	4889.8
East North Central	12704.9	12632.8	12961.8	13207.0	13543.6	13271.3	11880.9	11873.6	12265.8	11904.9	12261.7
Minnesota	965.3	800.5	860.7	793.7	794.6	969.6	1054.4	613.2	367.0	361.5	350.6
Iowa	1148.4	1284.2	1482.2	1412.5	1235.6	1343.9	1175.7	1201.6	1450.7	1300.0	1192.5
Missouri	1051.2	928.0	1028.9	966.5	879.4	947.3	719.2	739.5	937.6	840.9	614.3
North Dakota	184.1	233.1	233.1	140.1	204.2	189.4	128.7	64.8	74.0	100.4	60.3
South Dakota	311.0	293.5	343.1	352.9	374.4	391.4	335.5	333.6	431.5	344.1	506.4
Nebraska	352.0	414.6	385.3	334.5	309.0	289.8	288.5	331.5	400.8	343.6	279.2
Kansas	581.8	669.8	759.8	787.3	882.5	875.8	789.5	794.7	852.9	910.8	875.4
West North Central	4593.9	4624.0	5093.0	4787.5	4679.7	5007.2	4491.5	4078.0	4514.5	4201.3	3878.7
Delaware	--	--	--	--	--	--	--	--	--	--	126.0
Maryland	--	--	--	--	--	--	--	--	--	--	872.5
Virginia	1146.9	1134.1	1122.5	1165.3	1203.3	1226.8	1188.9	1308.9	1302.7	1320.1	1384.5
West Virginia	--	--	--	--	--	--	--	--	--	--	231.5
North Carolina	856.0	867.9	883.3	907.7	948.3	957.5	979.7	985.8	1011.2	1030.1	1062.6
South Carolina	--	--	--	--	--	--	--	--	--	--	372.2
Georgia	645.1	657.5	654.4	654.6	703.8	732.7	776.0	820.7	884.3	975.8	1007.4
Florida	1031.8	1032.8	1046.4	1068.9	1102.3	1194.9	1203.0	1140.0	1113.4	1208.6	1349.9
South Atlantic	5294.7	5361.5	5424.3	5516.4	5693.8	5864.9	5762.7	5843.0	5797.1	6102.8	6406.4
Kentucky	883.7	888.3	850.2	809.3	887.3	897.2	869.9	964.3	960.9	908.7	982.9
Tennessee	697.8	711.0	744.3	735.1	802.6	784.5	747.9	820.5	809.0	778.4	746.4
Alabama	491.5	490.6	474.7	485.9	515.9	519.3	518.3	508.7	507.8	516.6	544.9
Mississippi	556.9	574.8	583.4	596.0	645.1	651.0	624.9	629.8	652.5	671.4	643.7
East South Central	2630.0	2664.8	2652.6	2627.3	2851.0	2852.1	2761.2	2924.2	2930.2	2875.1	2916.9
Arkansas	332.8	352.8	329.1	322.6	291.2	261.7	220.7	273.5	292.2	272.4	277.7
Louisiana	592.6	600.8	632.5	675.8	708.4	719.3	734.1	738.8	770.4	779.3	839.4
Oklahoma	749.9	782.9	753.0	711.6	683.1	655.3	591.4	586.4	576.6	444.6	429.5
Texas	2174.4	2220.0	2169.5	2150.1	2172.4	2130.8	2166.2	2122.6	2116.0	2202.8	2318.2
West South Central	3849.8	3956.5	3884.1	3860.1	3855.2	3767.1	3712.4	3721.2	3755.3	3700.0	3864.8
Montana	198.2	872.0	188.9	185.2	178.7	177.2	181.8	178.5	185.3	161.3	167.0
Idaho	185.7	152.8	156.1	191.9	219.4	210.5	213.4	174.1	167.6	183.6	209.1
Wyoming	65.8	60.6	63.5	64.3	67.1	60.7	66.3	--	--	--	61.5
Colorado	309.9	327.4	355.6	370.8	361.4	373.7	395.4	410.0	417.5	450.3	453.9
New Mexico	174.0	186.9	208.9	220.2	220.7	210.7	231.4	235.4	224.7	218.7	227.6
Arizona	351.2	354.8	389.4	388.8	385.7	392.8	396.8	367.2	360.9	363.4	373.9
Utah	234.1	247.1	245.5	226.1	215.5	207.2	203.5	217.6	218.6	189.9	148.1
Nevada	80.5	77.9	92.4	100.6	105.0	105.6	107.0	107.5	109.3	110.4	109.9
Mountain	1599.5	1607.2	1700.3	1747.8	1753.3	1738.3	1795.7	1761.4	1749.4	1732.5	1751.1
Washington	907.1	836.9	839.4	847.4	857.4	908.5	971.7	1008.3	1022.1	957.1	999.7
Oregon	457.6	496.4	466.5	458.0	446.2	440.3	387.5	367.3	384.1	327.0	305.4
California	4668.5	4879.4	5019.9	5171.3	5123.7	5456.3	5366.3	5138.4	5090.0	5073.0	5102.8
Pacific	6033.2	6176.6	6325.8	6476.7	6427.3	6805.1	6725.5	6514.0	6496.2	6357.1	6407.8
48 States	52152.8	52606.5	53546.3	54041.3	54585.5	54735.5	52073.7	51285.2	51916.8	52141.0	51627.6

[a/] Dashes indicate that basic data needed for computations were unavailable.

Table 16. Class I utilization ratios: percentages of fluid grade milk used in fluid milk and cream products, by states, regions, and United States, 1961-71[a/]

Geographic Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Maine	83	84	86	85	89	90	90	89	88	89	88
New Hampshire	96	96	97	96	95	95	95	95	95	95	95
Vermont	87	85	82	83	82	81	79	80	74	74	70
Massachusetts	55	56	54	54	50	42	44	35	34	19	23
Rhode Island	66	68	68	62	66	75	74	66	68	73	70
Connecticut	79	77	78	80	70	72	70	68	62	65	61
New England	80	80	78	79	77	76	75	73	70	68	66
New York	66	65	65	67	66	69	66	68	66	75	65
New Jersey	70	73	69	65	64	61	56	53	58	52	45
Pennsylvania	72	73	71	71	73	74	74	71	69	69	67
Middle Atlantic	69	69	67	68	68	70	68	68	67	72	65
Ohio	64	63	66	68	69	68	65	65	62	60	59
Indiana	86	79	76	72	74	73	66	66	65	62	63
Illinois	63	64	67	61	63	58	50	44	46	48	44
Michigan	72	68	69	68	74	78	76	77	77	66	71
Wisconsin	60	53	50	51	54	60	53	56	57	55	47
East North Central	66	63	63	63	65	66	61	62	62	58	55
Minnesota	60	57	54	49	49	55	58	31	18	15	12
Iowa	103	118	129	113	101	125	108	106	125	95	84
Missouri	76	66	72	66	62	70	51	52	63	51	34
North Dakota	82	107	104	57	91	85	53	31	39	47	26
South Dakota	164	175	177	168	177	190	158	152	241	168	200
Nebraska	63	79	71	59	61	58	58	63	78	57	45
Kansas	61	72	81	80	92	88	77	75	78	79	74
West North Central	77	80	80	77	74	83	74	63	67	56	45
Delaware	--	--	--	--	--	--	--	--	--	--	98
Maryland	--	--	--	--	--	--	--	--	--	--	57
Virginia	99	98	97	97	99	98	94	97	98	95	96
West Virginia	--	--	--	--	--	--	--	--	--	--	73
North Carolina	82	81	81	80	80	82	82	81	82	80	81
South Carolina	--	--	--	--	--	--	--	--	--	--	78
Georgia	81	82	82	81	81	82	83	83	83	86	88
Florida	84	83	83	83	83	84	83	81	78	79	80
South Atlantic	81	81	82	81	82	83	80	80	78	79	80
Kentucky	85	85	81	74	76	72	67	76	73	64	65
Tennessee	69	71	75	71	72	68	63	67	63	58	53
Alabama	83	80	79	79	80	80	78	77	76	74	76
Mississippi	75	78	82	82	82	79	74	75	76	77	74
East South Central	79	80	80	76	77	73	70	73	71	67	65
Arkansas	78	87	84	83	75	65	54	66	69	69	68
Louisiana	79	77	79	81	80	79	78	78	77	76	78
Oklahoma	77	80	79	75	68	64	55	56	56	43	42
Texas	84	83	83	81	80	78	76	75	75	75	75
West South Central	81	81	82	80	77	74	70	71	71	69	69
Montana	99	438	94	88	85	82	83	78	80	71	68
Idaho	65	53	59	68	70	61	67	52	50	49	49
Wyoming	97	83	83	78	81	75	81	--	--	--	59
Colorado	51	52	55	54	53	55	57	58	56	58	57
New Mexico	84	85	85	87	87	86	89	89	87	86	86
Arizona	80	81	83	80	79	80	80	72	69	67	65
Utah	50	51	49	46	44	44	43	46	45	36	27
Nevada	80	74	82	84	84	85	86	83	83	82	83
Mountain	67	66	67	67	67	66	67	64	63	59	57
Washington	56	51	50	49	50	52	55	57	56	50	49
Oregon	83	86	86	82	75	71	60	56	58	47	41
California	80	81	80	75	75	76	74	68	67	64	62
Pacific	76	75	75	70	71	71	70	66	65	60	58
48 States	73	72	72	70	70	72	69	68	67	65	61

[a/] Dashes indicate that basic data needed for computations were unavailable.

TECHNICAL APPENDIX

This technical appendix provides a complete listing of all sources of data used in constructing the tables in the statistical appendix and a discussion of the methods used in constructing these tables.

Tables 1 Through 4

Quantities in tables 1 and 2 were obtained by using a procedure suggested by Smith (1). His procedure uses published data on P_F, P_M, and P_W where

P_F = average wholesale price received by farmers per cwt. of milk eligible for fluid use.

P_M = average wholesale price received by farmers per cwt. of manufacturing grade milk.

P_W = average wholesale price received by farmers for all whole milk sold.

Data on these prices are published regularly by the U.S. Department of Agriculture in bulletins of dairy statistics (2, 3, 5, 6, 7, 8, 9, 10). Historical values of all three prices also are published in statistical bulletins (5, 6). Current prices are published each spring in Agricultural Prices (7).

Also define

Q_F = quantity of milk eligible for fluid use marketed at wholesale by farmers.

Q_M = quantity of whole milk of manufacturing grade marketed at wholesale by farmers.

$Q_W = Q_F + Q_M$
= total quantity of whole milk marketed at wholesale by farmers.

The U.S. Department of Agriculture regularly publishes data on Q_W (2, 3, 8, 9, 10).

Smith's derivation proceeds as follows: Total income from whole milk marketings is represented by equation 1 and total marketings by equation 2.

$$(1)\quad P_F Q_F + P_M Q_M = P_W Q_W$$

$$(2)\quad Q_F + Q_M = Q_W$$

Equations 1 and 2 can be solved for Q_F and Q_M, yielding

$$(3)\quad Q_F = (P_W - P_M)\, Q_W / (P_F - P_M)$$

$$(4)\quad Q_M = Q_W - Q_F$$

The right-hand side of equation 3 was used to obtain the quantities in tables 1 and 2. The right-hand side of equation 4 was used to obtain the quantities in tables 3 and 4.

Tables 5 Through 7

Tables 5 through 7 were copied directly from U.S. Department of Agriculture publications (2, 3, 5, 6, 8, 9, 10).

Table 8

From equation 3 we obtain

$$(5)\quad Q_F / Q_W = (P_W - P_M)/(P_F - P_M)$$

The right-hand side of equation 5 was used to obtain the ratios in table 8.

The U.S. Department of Agriculture publishes no data on P_M for the New England states or for certain other states and regions. For some of these states, $P_F = P_W$. Looking at equation 1 we see that, for $P_F = P_W$, it is necessary that either: a) $P_F = P_M$ or b) $P_M Q_M = 0$. We can reject possibility a. Now $P_M Q_M = 0$ if, and only if, either $P_M = 0$ or $Q_M = 0$. Rejecting $P_M = 0$, we are left with the conclusion that, if $P_F = P_W$, then $Q_M = 0$. Every figure of 100 percent in table 8 identifies an area and year in which $P_F = P_W$ and data on P_M are not available. The only exception is New York State for the years 1963 through 1967. Data on P_M are available for New York for these years, but $P_F = P_W$; hence, equation 5 yields a ratio of 100 percent.

The published prices used in equation 5 may contain errors of measurement. To see how these errors affect the estimated ratios, let P_W, P_M, and P_F be the published prices and R be the value of Q_F / Q_W obtained from substituting these published prices into equation 5. Let $P_W + \Delta P_W$, $P_M + \Delta P_M$, and $P_F + \Delta P_F$ be the true values of the prices, and let $R + \Delta R$ be the true ratio of fluid grade milk to whole milk marketings. ΔP_W, ΔP_M and ΔP_F are the errors in the published prices, and ΔR is the error in the estimated ratio. Then

$$R + \Delta R = [P_W + \Delta P_W - (P_M + \Delta P_M)] \;/\; [P_F + \Delta P_F - (P_M + \Delta P_M)]$$

and the error in the estimated ratio is

$$\Delta R = \Delta RN / \Delta RD$$

where

$$\Delta RN = (P_F - P_M)(\Delta P_W - \Delta P_M) - (P_W - P_M)(\Delta P_F - \Delta P_M)$$

$$\Delta RD = (P_F - P_M)^2 + (P_F - P_M)(\Delta P_F - \Delta P_M)$$

For Iowa in 1970, published prices are P_F = \$5.63, P_M = \$4.66, and P_W = \$4.97. Suppose ΔP_F = \$0.15, ΔP_M = −\$0.10, and ΔP_W = \$0.05. Then $\Delta R = 0.0680/1.18 = 5.76$ percent. This compares with R = 32 percent.

Tables 9 and 10

Tables 9 and 10 are copied directly from a U.S. Department of Agriculture publication (10). Each annual edition of this publication presents ratios for the most recent year. These ratios for regions also were published in May issues of Dairy Situation (4).

Table 11

Neither table 8 nor table 10 contains data for Wyoming for the years 1968–70. Neither table contains data for Delaware, Maryland, West Virginia, and South Carolina for years before 1971.

When data are missing for only one state in a region, it is easy to estimate the ratio for that state by using tables 1, 3, 8, and 12. Suppose it is desired to compute the ratio for the first state in a region where ratios have been computed for other states.

Let Q_{W1}, Q_{F1}, and Q_{M1} represent the values of Q_W, Q_F, and Q_M for the first state in region R, and let there be S states in the region. Also let Q_{WR}, Q_{FR}, and Q_{MR} represent the values of Q_W, Q_F, and Q_M for this region. And let p_l and p_r be the values of Q_{F1}/Q_{W1} and Q_{FR}/Q_{WR}.

Now, by definition, Q_{F1} satisfies the two equations

$$Q_{F1} + \sum_{s=2}^{S} Q_{Fs} = Q_{FR}$$

$$Q_{F1} = Q_{W1}(Q_{F1}/Q_{W1})$$

Substituting the second into the first and rearranging terms yields

$$Q_{W1}(Q_{F1}/Q_{W1}) = Q_{FR} - \sum_{s} Q_{Fs}$$

Hence

$$(6)\quad Q_{F1}/Q_{W1} = (Q_{FR} - \sum_{s} Q_{Fs})/Q_{W1}$$

Tables 1 and 2 provide data on Q_{FR} and Q_{Fs}. Table 5 provides data on Q_{W1}. Hence, Q_{F1}/Q_{W1} can be computed from the right-hand side of equation 6. This equation was used to provide the estimates for Wyoming in table 11.

A slightly different procedure can be used to provide estimates for several missing states in a region if we know (or are willing to assume) something about the relations among the ratios in these states. Suppose table 8 or 9 provides ratios for states 1, 2, . . ., K, and we desire to estimate ratios for states K + 1, K + 2, . . ., S. We know that

$$(7)\quad \sum_{s=K+1}^{S} Q_{Fs} = Q_{FR} - \sum_{s=1}^{K} Q_{Fs}$$

$$(8)\quad \sum_{s=K+1}^{S} Q_{Fs} = \sum_{s=K+1}^{S} p_s Q_{Ws}$$

Suppose we believe that Q_F/Q_W is the same for states K + 1, K + 2, . . ., S. Let the common values of these ratios be p. Then the right-hand side of 8 becomes $p \sum_{s=K+1}^{S} Q_{Ws}$. Substituting this expression into the left-hand side of 7 and dividing yields

$$(9)\quad p = (Q_{FR} - \sum_{s=1}^{K} Q_{Fs}) / (\sum_{s=K+1}^{S} Q_{Ws})$$

Equation 9 was used to provide the estimates for the South Atlantic states in table 11.

An alternative to equation 9 can be derived by assuming $p_{K+1} = p_S + d_1$, $p_{K+2} = p_S + d_2$, . . ., $p_{S-1} = p_S + d_{S-1}$ where $d_1, d_2, \ldots, d_{S-1}$ are known.

Table 12

Ratios in table 12 were obtained by using ratios from table 8 and data published by the U.S. Department of Agriculture on total quantity of whole milk marketed at wholesale (Q_W) and on Q_C.

Q_C = whole milk equivalent of farm-separated cream sold by farmers.

Letting p represent the percentages in table 8, the percentages in table 12 were obtained from equation 10.

$$(10)\quad Q_F/(Q_W + Q_C) = 0.01pQ_W/(Q_W + Q_C)$$

Current state and regional data on Q_W and Q_C are available annually (10). Data for earlier years also are published by the U.S. Department of Agriculture (2, 3, 5, 6, 8, 9).

Tables 13 Through 16

Data in table 13 were obtained by using data from tables 3 and 4 on Q_M, from table 7 on Q_C, and data published by the U.S. Department of Agriculture on Q_{AM} (11) where

Q_{AM} = net total whole milk equivalent of all milk used in manufactured dairy products.

Define

Q_{FM} = quantity of fluid grade milk used in manufactured dairy products.

This variable can be estimated from

$$(11)\quad Q_{FM} = Q_{AM} - (Q_M + Q_C)$$

Dividing both sides by Q_{AM} yields

$$(12)\quad Q_{FM}/Q_{AM} = 1 - (Q_M + Q_C)/Q_{AM}$$

Percentages in table 13 were obtained by computing the right-hand side of equation 12 and multiplying by 100. Figures in table 14 were obtained from the right-hand side of equation 11.

Define Q_{FF} as

Q_{FF} = quantity of fluid grade milk used in fluid milk and cream products.

Data in table 15 were obtained from equation 13

$$(13)\quad Q_{FF} = Q_F - Q_{FM}$$

The fluid milk utilization ratios in table 16 were obtained from

$$(14)\quad Q_{FF}/Q_F = 1 - Q_{FM}/Q_F$$

Interstate shipments of milk cause some errors in the state figures in tables 13 through 16, and interregional shipments of milk cause some errors in the regional figures in these tables. Some insight into the sources and magnitudes of these errors is provided by the following analysis. Define

QF_sF_s = quantity of fluid grade milk produced in state s and consumed in fluid products in state s.

QF_sM_s = quantity of fluid grade milk produced in state s and used in manufactured dairy products in state s.

QF_sF_o = quantity of fluid grade milk produced in state s and consumed in fluid dairy products in other states.

QF_oF_s = quantity of fluid grade milk produced in other states and used in fluid dairy products in state s.

QF_sM_o = quantity of fluid grade milk produced in state s and used in manufactured products in other states.

QF_oM_s = quantity of fluid grade milk produced in other states and used in manufactured products in state s.

QM_{ss} = quantity of manufacturing grade milk produced in state s and processed in state s.

QM_{so} = quantity of manufacturing grade milk produced in state s and shipped to other states for processing.

QM_{os} = quantity of manufacturing grade milk produced in other states and shipped into state s for processing.

QC_{ss} = whole milk equivalent of quantity of farm-separated cream produced in state s and processed in state s.

QC_{so} = whole milk equivalent of farm-separated cream produced in state s and processed in other states.

QC_{os} = whole milk equivalent of farm-separated cream produced in other states and shipped into state s for processing.

The entry for state s in table 14 is E_{14s}.

$$E_{14s} = (QF_sM_s + QF_oM_s + QM_{ss} + QM_{os} + QC_{ss} + QC_{os}) - (QM_{ss} + QM_{so}) - (QC_{ss} + QC_{so})$$

The terms in the first, second, and third sets of parentheses on the right-hand side of this equation are Q_{AM}, Q_M, and Q_C of equation 11. The desired entry in table 14 is DE_{14s}.

$$DE_{14s} = QF_sM_s + QF_sM_o$$

Hence

$$E_{14s} = DE_{14s} + (QF_oM_s - QF_sM_o) + (QM_{os} - QM_{so}) + (QC_{os} - QC_{so}) = DE_{14s} + \Delta E_{14s}$$

where ΔE_{14s} is the error in E_{14s}.

Thus, $E_{14s} < DE_{14s}$ if

$$QM_{os} + QC_{os} - (QM_{so} + QC_{so}) > QF_sM_o - QF_oM_s$$

alternatively, $E_{14s} < DE_{14s}$ if

$$QM_{os} + QC_{os} + QF_oM_s > QM_{so} + QC_{so} + QF_sM_o$$

Thus, E_{14s} is too small if the excess of inshipments of manufacturing grade milk and cream into state s for processing over the outshipments of manufacturing grade milk and cream exceeds the excess of outshipments of fluid grade milk used in processed products over inshipments of fluid grade milk used in manufactured products. The negative entries for Iowa, North Dakota, Montana, and South Dakota in table 14 mean that ΔE_{14s} is negative and larger in absolute value than DE_{14s}. Alternatively, E_{14s} is too small if inshipments of milk for processing exceed outshipments of milk for processing.

Any error in table 14 also causes error in table 13. Let the entry for state s in table 13 be E_{13s}.

$$E_{13s} = \text{Num. } E_{13s} / \text{Denom. } E_{13s}$$

Let the desired entry be DE_{13s}.

$$DE_{13s} = \text{Num. } DE_{13s} / \text{Denom. } DE_{13s}$$

where

$$\text{Num. } DE_{13s} = QF_sM_s + QF_sM_o$$

$$\text{Denom. } DE_{13s} = QF_sM_s + QF_sM_o + QM_{ss} + QM_{so} + QC_{ss} + QC_{so}$$

Then

$$E_{13s} = (\text{Num. } DE_{13s} + \Delta E_{14s}) / (\text{Denom. } DE_{13s} + \Delta E_{14s})$$

Errors in table 14 likewise carry over in table 15. Let the actual and desired entries for state s in table 15 be E_{15s} and DE_{15s}.

$$E_{15s} = QF_sF_s + QF_sF_o + (QF_sM_o - QF_oM_s) + (QM_{so} - QM_{os}) + (QC_{so} - QC_{os})$$

$$DE_{15s} = QF_sF_s + QF_sF_o$$

Hence

$$E_{15s} = DE_{15s} - \Delta E_{14s}$$

Further, for table 16

$$E_{16s} = (DE_{16s} - \Delta E_{14s}) / (QF_sF_s + QF_sF_o + QF_sM_s + QF_sM_o)$$

The negative values of ΔE_{14s} for Iowa and South Dakota cause values of E_{16s} of greater than 100 percent.

Most students of dairy marketing would probably agree that we can expect ΔE_{14} to be smaller relative to DE_{14} for regions than for states. If we accept this expectation as fact, then we can agree that regional entries in tables 13 through 16 are more reliable than state entries; viz., that the errors as percentages of desired values are smaller for regions than for states.

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